A PARTNERSHIP FOR AN EVERGREEN REVOLUTION

U.S. - India collaboration helped produce the Green Revolution of the 1960s, which led to major advances in agriculture and saved millions of people around the world from starvation. Today, the United States and India are engaged in a **new partnership** that has the potential **to create a second, more sustainable, and greener revolution**—one that will benefit farmers and consumers in India, in the United States, and around the globe.

The partnership will address global challenges in agriculture and food security by leveraging Indian and U.S. expertise. The United States has unparalleled capability in science, technology, food processing, and weather forecasting, while India is a leader in biotechnology, higher education, and the development of low-cost technologies that directly benefit farmers. **Working together**, the United States and India will **develop breakthrough solutions** that have the power to transform agricultural systems and address the challenges of food security in India and around the world.

Partnering to Expand Technical Cooperation in Agriculture and Food Security

Through multiple exchanges among public and private sector partners, U.S.- India technical cooperation will **boost capacity in weather, climate, and crop forecasting; improve farm-to-market links**; and **invest in research and innovations** that can enhance productivity in India and the United States and share new technologies for achieving global food security with developing nations.

Expected Impact:

- Over 10 million households will better manage the risk of catastrophic weather-related crop loss.
- The Indian food processing industry will be enhanced, and the safety and quality control of food produced in and imported to India will be improved.
- Approximately 1.5 million Indian farm households will decrease their water use by 25 percent and will increase their production, yield, and net profit by 30 percent through the use of input-saving technologies.
- New agricultural and food security related technologies will be developed, tested, and deployed.
- Real-time information on crops, weather, and market prices will be available to 10 million farmers.

Partnering for Food Security in Africa

Working together, the United States and India will seek **collaborative, breakthrough innovations in agricultural research, technology, and natural resource management to improve food security in Africa**. Technical collaboration, technology transfer, and innovation on the ground will be launched with three African partners, with the hope of expanding throughout the continent in the coming years. In both India and Africa, the partnership will accelerate access to the latest innovations and technology by advancing cutting-edge research; strengthening extension services; expanding technology-enabled market

access for farmers; building individual and institutional capacity; and supporting the development, advancement, and implementation of government policies.

Expected Impact:

- Ten India-sourced agriculture technologies will be customized for deployment in at least three regions of Africa.

- During the first years of the partnership, approximately 50,000 African farm households could benefit from advanced technologies sourced in India (drought-tolerant, insect-resistant, high-yielding crops, for example), which can decrease water use by 25 percent or increase production, yield, or net profit by 30 percent through the use of input-saving technologies.

- Thousands of Africans will be trained in agricultural production, natural resource management, and agricultural marketing/extension through Indian universities and their partnerships with other training institutions,

- New institutional relationships developed between Indian and African universities will expand and improve private and public extension services.

- Each year, 200 Africans and Indians will participate in an exchange program to share approaches, technologies, and scientific advances.

- Cooperation, collaboration, and information exchange on environmentally sustainable aquaculture and fisheries management practices will increase.

Global Benefits of the Partnership

For India The partnership will greatly benefit India through investments in Indian institutions, international research, education, and information partnerships, assistance to Indian farmers and other food producers, and alliances with Indian policymakers.

For the United States The partnership will encourage breakthroughs in research and advance sustainable natural resource management practices on a global scale to ensure food security worldwide. This will advance the policy goal of reducing chronic hunger globally by building a foundation for investments in health, education, and economic growth. The partnership also will open up greater opportunities for American companies to partner and invest in India and provide a more favorable climate for trade.

For Africa The partnership will establish links that will allow improvements in food security in India to drive advances in Africa more rapidly. It will strengthen systems that enable African farm households to benefit from advanced technologies sourced in India; train African students in science and technology related to food security; expand and improve private and public extension services in Africa; and establish an exchange program to share approaches, technologies, and scientific advances that have applications in both contexts.

Through the partnership, the U.S. Agency for International Development will focus on four broad areas: (1) cutting-edge technologies to address productivity issues for food security and making agriculture climate resilient; (2) conservation agriculture and management of natural resources; (3) agricultural extension and innovation; and (4) human resource development in agriculture and institutional capacity building. Specific activities will help to improve crop systems and increase crop yields, address the challenges of climate change, link farmers to value chains, and improve nutrition at the household level. Programs will work to build the teaching, research, and extension capacity of agricultural institutions, so that they are able to better respond to the profes-

sional needs of a market-led agricultural system. Technological innovations and the latest scientific knowledge will raise agricultural productivity and increase farmers' incomes, as well as build a more efficient demand-driven and market-led agricultural system.

An on-going partnership between USAID, British Telecom, Cisco, and the NGO OneWorld provides farmers with information on good agricultural practices via voicemail. The LifeLines India Partnership demonstrated a 20-30 percent increase in productivity among users. The service is simple: farmers call a voicemail number where they can record their questions about agriculture issues. A dedicated knowledge worker then finds the answer through a panel of agricultural and veterinary experts, using an innovative Internet-based application developed by Cisco. Farmers can retrieve the answer by voicemail at a cost of about 11 cents. Since the partnership began in 2006, more than 100,000 farmers have benefited.

Through the partnership, the U.S. Trade and Development Agency (USTDA) will sponsor a reverse trade mission that will bring leading Indian public and private sector officials to the United States to study temperature-controlled supply chains, known as "cold chains." The officials will examine modern cold chain technologies and services that can assist India in improving its extensive food value chain and growing cold storage industry. Attendance at the Annual Convention and Expo of the International Association of Refrigerated Warehouses/World Food Logistics Organization, planned for May 2011 in New Orleans, LA, would be a cornerstone of the mission. Other highlights of the mission will include site visits to U.S. equipment manufacturers and cold storage facilities, meetings with industry associations, and discussions with appropriate U.S. Government representatives to maximize exposure to U.S. best practices, standards, and technologies.

In 2007-2008, USTDA sponsored the Cold Chain System Improvement Technical Assistance program, which provided training and workshops on cold chain infrastructure and practices that could benefit India. The program included four workshops (in New Delhi, Mumbai, Chennai, and Kolkata), introduced U.S. system providers and industry best practices, and incorporated a tailored public and private sector orientation visit to the United States for leaders in the Indian cold chain system. As a result of the workshops, the Global Cold Chain Alliance has established an office in New Delhi to support U.S. companies interested in pursuing business opportunities in the Indian market.

As part of the partnership, the U.S. National Oceanic and Atmospheric Administration (NOAA) and the Indian Ministry of Earth Sciences seek to improve the quality of seasonal and long-range forecasts beginning with the 2011 monsoon season. The aim is to address the needs of millions of farmers who must cope with an uncertain monsoon by improving the quality of forecasts and strengthening their ability to interpret and act on forecasts. The inability to plan for and adapt to variable and extreme weather events—such as the monsoon, which provides 80 percent of India's total annual rainfall—can result in catastrophic crop losses and crippling impacts on rural communities. Multiple agencies and institutions in both countries are working toward the longer-term goal of developing a comprehensive system that will integrate weather forecasting, water scarcity information, crop forecasting, and market assessments to help policy makers, farmers, and agricultural marketing organizations plan and make decisions that will increase agricultural yield and

reduce negative impacts to livelihoods and the economy.

The International Research Institute for Climate and Society (IRI), funded by NOAA and India's Ministry of Agriculture, is partnering with numerous Indian agencies and agriculture universities on the Extended Range Forecast System for Climate Risk Management in Agriculture. This system consolidates information on climate forecasts, agriculture risks, and risk management options at the plot and farm levels, for specific crops, to assist farmers and others in making decisions. The system utilizes risk forecasts from simulation models and integrates information into an all-India Data Library and online maprooms. In addition, IRI has co-hosted two capacity building events in India and sponsored several Indian scientists for six-month research visits to improve forecast and agriculture risk management methodologies.

Through the U.S. Department of Agriculture's (USDA) Borlaug and Cochran Fellowship Programs, the United States has collaborated with India in the areas of food safety; food processing and marketing; post-harvest handling, including soybean processing; water management; and domestic farm policy. The United States will collaborate with India to develop policy and training opportunities for developing public-private partnerships in agriculture. This program will create tools that can spur new private investment in agribusiness in India. USDA Forest Service is working with the Wildlife Institute of India and the Indira Gandhi National Forest Academy on integrated forest planning and conservation of biological diversity.

Under USDA's Scientific Cooperation Research Program, scientists from Montana State University and the Indian Agricultural Research Institute conducted joint research on Ascochyta blight resistance. The research has increased the yields of chickpeas in India and the United States, thereby enhancing the development of sustainable agricultural systems while increasing incomes of rural farmers.